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ABSTRACT

Research was conducted concerning the efficacy of advance organizers and structured overviews in aiding student recall. The research was modeled on a process described by J.R. Platt that involves refining experiments and testing alternative hypotheses. Four studies that gradually refined experimental error were conducted on the effects of advance organizers in relation to learning tasks. Three studies indicated no significant differences between students who used advance organizers and graphic structured overviews and students in control groups who were given neither type of organizer. A fourth study utilized a student-constructed graphic postorganizer condition in addition to a graphic advance organizer and control condition. Results of this study indicated that the student-constructed postorganizer condition was more effective than the other two conditions. (MKM)

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A SYSTEMATIC RESEARCH PROCEDURE, ORGANIZERS, AND OVERVIEWS: AN HISTORICAL PERSPECTIVE

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Some years ago John R. Platt (1964) published a delightful article in which he chided social scientists for engaging in a process termed "weak inference." According to Platt, the most common research process in the social sciences involves generating an hypothesis about a particular phenomena, becoming attached to it, and forcing the results of experimentation to fit the theory. Platt suggested that we return to "strong inference" processes which involve formulating a testing rival alternative hypotheses and designing experiments that will exclude (or disprove) one or more of these hypotheses.

This paper describes an attempt to apply a systematic procedure similar to that described by Platt to test the efficacy of advance organizers. The process resulted in the investigator being unable to determine a point at which advance organizers demonstrated "practical utility." This, in turn, led to the development of an alternative hypothesis for the purported effects of advance organizers.

The paper has three purposes. First, since the author is not a research expert, the process to be described needs analysis and criticism from those who are more knowledgeable: Is it viable in other applied instructional methods investigations? Second, it is anticipated that the paper might serve

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to clarify what seems to be growing confusion among the terms advance organizer, structured overview, and graphic post-organizer. Finally, it is hoped that the paper, in conjunction with a recent meta-analysis study by Moore and Readance (1979), might serve to divert attention away from advance organizers as a treatment variable and toward more profitable lines of research.

BACKGROUND

Reception Learning

During the 1960's, in opposition to ruling theory and practice centering upon "discovery learning," David P. Ausubel (1963, 1968) began to defend a process he termed reception learning. In this type of learning, the content of what is to be learned is presented to the student in final form, as in viewing a film, reading an assignment, or listening to a lecture. The learner's task is to internalize the information so it is available at some future time.

Space precludes a complete discussion of Ausubel's theoretical assertions regarding how reception learning occurs. The salient aspects, however, appear to be as follows. The key proposition is that one's existing background of knowledge or cognitive structure is the principal factor in acquiring new meanings. Ausubel reasoned that existing cognitive structure is hierarchically organized, consisting of highly general, inclusive conceptual traces under which are subsumed less inclusive ideas. New meanings are presumably acquired through an assimilation process whereby unfamiliar information is incorporated into the broader knowledge system. Thus, if existing cognitive structure is clear, stable, and organized new learning should be facilitated. Conversely, if existing cognitive structure is unclear and disorganized, new learning should be impeded.

The theory appeared to be supported in a series of investigations in which a learning task, usually involving reading, was preceded by a device termed an "advance organizer." As implemented by Ausubel, this device took the form of a short, prose passage dealing with the content of the learning task at a higher level of generality, abstraction and inclusiveness. Advance organizers were purported to facilitate learning in at least two ways. First, it was claimed that they provided a conceptual framework to which the more specific, detailed information in the learning passage could be related. Second, it was argued that they assisted the learner in discriminating between the new material and similar or ostensibly conflicting ideas in existing cognitive structure.

Structured Overviews and Graphic Organizers

Subsequently, an obscure first-year, first-semester graduate student at Syracuse University composed a term paper describing a readiness activity which he termed a "structured overview" (Barron, 1969). This procedure involved displaying and discussing a diagram depicting relationships among vocabulary terms in a new learning task, relative to terminology presumably mastered by the students. It was argued on logical grounds that the structured overview appeared to fulfill the properties of advance organizers (Barron, 1969). Two studies supported this claim (Estes, et al, 1969; Earle, 1970) as did Ausubel himself. Ausubel observed that "the structured overview appears to be a special, though more limited, form of advance organizer."[1] He also suggested replacing the term "structured overview" with "graphic organizer."

The aforementioned studies and Ausubel's acknowledgement were important to subsequent studies. This was so because prose organizers had not effectively been operationally defined. However, an operational definition had

[1]Correspondence to the author, 1969.

been developed for the structured overview or graphic organizer--seemingly a special form of advance organizer.

The present author's interest in organizers waned for a period of time in favor of attending classes, studying, and designing and conducting dissertation research. However, during that period of time increasingly equivocal results began to appear in the literature for both types of organizers. Despite this situation, both types of organizers were also beginning to appear in textbooks as "useful" pedagogical tools.

This seemingly untenable state of affairs, coupled with the reading of Piaget (1964) mentioned earlier, led to the planning of a series of interlocking studies designed to address the question: "When, if ever, might one suggest to a classroom teacher that he or she use an advance organizer?" The process involved an attempt to refine experimental "error" by introducing control variables judged to be easily identified by classroom teachers and potentially useful as a means of differentiating instruction. Thus, the process was directed to ascertaining the "practical utility" of both reception learning theory and organizers as a pedagogical tool.

FOUR STUDIES

Study I (Grade Level)

Barron (1972) investigated the effects of advance organizers in relation to grade level upon learning from a passage of general science content. Subjects in grades six through twelve were randomly assigned to three treatment conditions: prose organizer, graphic organizer, and control (no introduction). The content and readability level of the learning passage were aimed at ninth grade students and held constant across the seven grade levels.

It was hypothesized that an s-shaped learning curve would appear across the grade levels. That is, according to Ausubel the organizers initially

should have demonstrated little or no effect due to the weak and unstable cognitive structures of the younger subjects. This effect should have increased to some maximum point, before dissipating with the older subjects, who presumably had well-organized cognitive structures in relation to the learning task.

Analysis of the data showed no significant differences between the organizer conditions and the control group at any of the seven grade levels. Since the learning curve across grade levels resembled a gradually rising straight line, it appeared that within-grade-level variability negated potential treatment effects. This, in turn, seemed to preclude claims that advance organizers demonstrate a general facilitative effect upon learning.

Study 2 (Reading Ability)

Estes (1972) investigated the effects of advance organizers in relation to general reading ability upon learning from a passage of social studies content. Subjects at each of four reading grade levels (below 7.0; 7.0-8.9; 9.0-10.9; above 10.9) as measured by a standardized test, were randomly assigned to three treatment conditions: prose organizer, graphic organizer, and control. Materials were held constant and it was hypothosized that where passage difficulty was within the ability range of the reader, the organizers would facilitate comprehension.

Analysis of the data indicated no significant differences between the organizer conditions and the control group at any of the four reading ability levels. It was concluded that within-reading-ability variance precluded using this variable as a guide for the use of advance organizers.

Study 3 (Instructional Level)

Barron and Cooper (1973) attempted to determine whether the application of organizers in classrooms could be determined by "passage-specific reading

ability"--as determined by a cloze readability test.

Prior to conducting the study, a fifty-item cloze test, based upon the learning passage, was administered to students in grades eight through eleven. The final sample was drawn from students for whom the passage represented an instructional reading level, according to criteria specified by Bormuth (1969). The organizer conditions and materials were the same as those applied in an earlier study (Barron, 1972).

A two-way, unweighted means analysis of variance (Treatment x Grade Level) was applied. No significant main effects nor interactions were observed. It was concluded that within-"instructional-level" variability precluded using this variable as a determinant in the provision of advance organizers.

Study 4 (An Alternate Hypothesis)

Ausubel (1968) stated that advance organizers will not fulfill their intended function in the absence of a meaningful learning set, defined as a disposition to relate new material in a non-arbitrary, substantive fashion to one's existing cognitive structure. Barron and Stone (1974) posited this as a rival hypothesis to explain the equivocal nature of research surrounding advance organizers. That is, they suggested that in studies where organizers ostensibly enhanced learning, their effect was not due to a strengthening of existing cognitive structure. Rather, the organizer treatments in these studies signaled subjects to adopt a meaningful learning set. Thus, Barron and Stone attempted to operationally define a treatment which decreased the probability of subjects treating the learning passage in a non-meaningful or rote fashion.

One hundred forty-one tenth and twelfth grade students were randomly assigned to three treatment conditions, each implemented over a two-day period.

In the graphic post-organizer condition, students read a learning passage about mental health on the first day. The next day they were: (a) shown how to construct a graphic organizer; (b) placed in groups of three to five individuals and provided with the learning passage, a list of key words from the passage, and a packet of index cards; (c) asked to write the key words on the index cards and construct a group-developed organizer.

In the graphic advance organizer condition, students received an experimenter-constructed graphic advance organizer prior to reading the learning passage. They then read the passage. On the second day they reread the learning passage.

Students in the control condition simply read the passage on two successive days.

The outcome measure was administered on the third day. It was designed to assess subjects' understanding of hierarchical and parallel relationships among concepts discussed in the learning passage. Analysis of the data via orthogonal planned comparisons showed no significant difference between the graphic advance organizer and the control condition. However, a significant difference ($p < .05$) was observed favoring the student-constructed post-organizer condition over the advance organizer treatment. It was concluded that studies purporting to show significant effects for advance organizers may have done so by inadvertently manipulating reading/learning processes rather than cognitive structure variables.

CONCLUSIONS

Research Process

This paper described a research process modeled after one described by Platt (1964). The procedure involved attempting to determine when an

instructional treatment--in this case, advance organizers--achieved a degree of "practical utility." This was accomplished by conducting three interlocking studies which gradually refined experimental "error" via variables judged to be measurable by classroom teachers. A fortunate, though not necessarily guaranteed, outcome involved generation of an alternative hypothesis and development of a seemingly more effective treatment than the one originally under investigation. Whether the process has value for other applied educational methods studies remains to be determined.

Post Organizers

Recent investigations (Barron and Schwartz, 1979; Vaughn, et al) have provided strong support for the efficacy of student-constructed post-organizers on particular types of learning outcomes. Whether this effect is due to instructional set or some other factor or factors is a topic for further investigation.

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